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Argument on translocation of marsh crocodiles (*Crocodylus palustris*) in Gujarat, India

Raju Vyas

ABSTRACT

Presenting arguments and raising questions on the recently large number of translocations of the mugger or marsh crocodile (*Crocodylus palustris*) from a developed tourist complex known as the Statue of Unity (SOU) at the Narmada Dam site, Kevadia, Narmada, Gujarat, in the name of the safety measures of tourists. As per the authorities, a total of 194 muggers were captured within a two-year operation from 2019-21. 51 various-sized animals were translocated in two captive facilities, and 70 crocs were released back to nature away from the Narmada dam site. This is the first and largest translocation operation of Marsh Crocodiles captured from the wild in Indian history. This translocation operation practice of eliminating marsh crocodiles from their prime habitat to confined areas was discussed throughout the episode. This biased operation was unethical, did not meet any scientific criteria, and raised many unanswered questions. However, this is a matter of conservation and a deep concern of Hindu philosophy.

Keywords: Conflict, Conservation Issues, Elimination, Reptile, Rescues, River, Religion

1. INTRODUCTION

The IUCN/SSC guideline defined the terminology translocations, which means the human-mediated movement of organisms from one area to release into another area (IUCN, 2013). It is often undertaken in captive-breeding stocks to release in natural habitats for reintroduction programs, or it may organisms take from human dominant landscape to a new natural habitat away from human settlement areas or it confine habitat – are playing an increasingly important role in the conservation of reptiles, including crocodilians (Germano and Bishop, 2009; Ewen et al., 2014; Burke, 2015). In many cases, translocation may be the only remaining option for reestablishing depleted or extirpated populations (Stofer, 1999).

The translocation practice is noticeable in Indian scenarios for a few reptilian species, especially crocodilians. The present flourishing crocodilian populations of three Indian crocodilians, Indian Gharial *Gavialis gangeticus*, Salt Water Crocodile *Crocodylus porosus* and Marsh Crocodile *C. palustris*, are thanks to the Crocodiles Conservation Program (Choudhury and Chowdhury, 1986). It was the practice of

collecting eggs from the wild, incubating and rearing them in captive conditions, and head-starting subadults released in nature, which was part of reintroduction programs (Jacobson, 1999). This was the scientific translocation program with the pure motivation of restocking and reintroduction in nature for all three species of crocodilians, therefore, its success (Singh, 1999).

The crocodiles were often rescued from human settlement areas and translocated away from human habitats to avoid worse situations. This practice results in human-crocodile conflict (HCC), preventing further conflict. Such translocation is the case with notoriously problematic specifics, such as an individual animal or a small batch of animals involved in the HCC. However, recent news shows a significant number of marsh crocodiles or muggers (*C. palustris*) were translocated from a developed tourist complex known as the Statue of Unity (SOU) at Narmada Dam site, Kevadia, Narmada, Gujarat, for the safety measures of tourists (Figure 1).

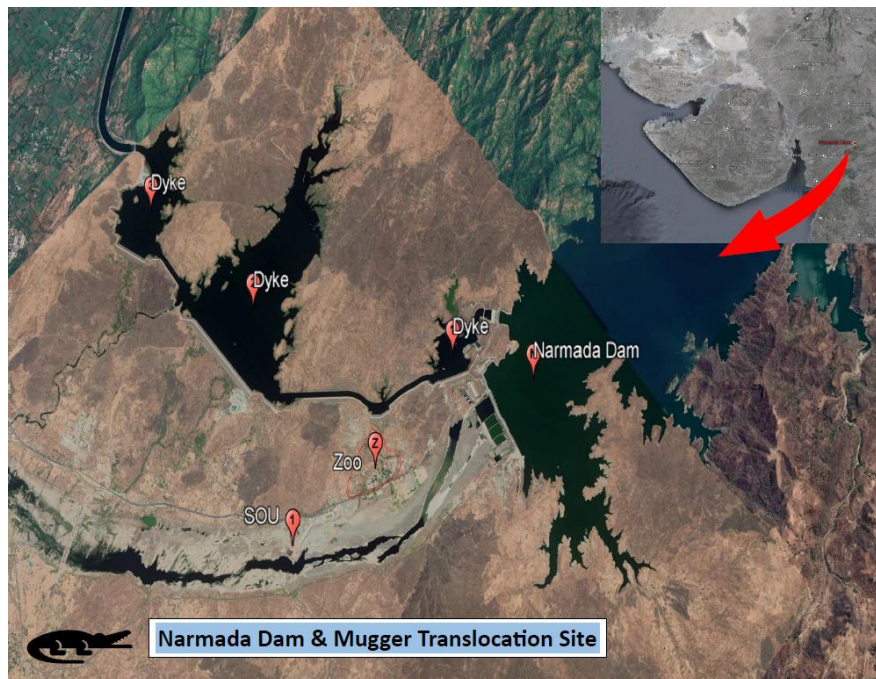


Figure 1 Map of the Narmada Dam area shows the location of the mugger's captured sites and the Statue of Unity (SoU) Tourist Complex, Kevadia, Rajpipala, Gujarat, India.

Therefore, I have addressed this translocation practice of eliminating marsh crocodiles from their prime habitat to confined areas and discussed the entire episode. Sinha, (2019) stated that this biased operation was unethical, did not meet any scientific criteria, and raised many unanswered questions. However, the Marsh crocodile is a legally protected species, and its distribution ranges from Iran to India, Bangladesh, and Sri Lanka (Bors et al., 2024). Mugger is a 'Schedule I' species under the Indian Wildlife Protection Act 1972, amendment 2023 and 'Vulnerable' species are considered as per the IUCN/SSC Redlist Data Book (Choudhury and De-Silva, 2013). This high status indicates that species face risks in the wild and still need legal protection (Bors et al., 2024).

2. OBSERVATION

There was tempting news in many print and electronic media: On 5th July 2021, a total of 194 Mugger Crocodiles were relocated from Punchmuli Lake near the world's tallest statue of Sardar Vallabhai Patel, SoU, Kevadia, Narmada District, Gujarat. This news was released by the range officer of the forest, Kevadia, Vadodara Wildlife Division, State Forest Department of Gujarat, India (Figure 2). A total of 194 muggers were captured during a two-year operation (2019-21). The press details show the last year in 2019-20 (October-March), 143 muggers relocated from the tourist complex of SoU, Punchmuli Lake (Dyke 3), Sardar Sarovar Dam (Narmada Dam) area, and 73 were released in the dam waters area. In 2020-21, another 51 crocodiles were moved to two rescue facilities in Gandhinagar (Indroda Nature Park, GEER Foundation) and Godhara (Sharma, 2021).

Nearly 200 crocodiles relocated from lake near Statue of Unity for tourists' safety

By hindustantimes.com | Written by Deepali Sharma | Edited by Meenakshi Ray, Hindustan Times, New Delhi
5 July 2021 at 17:21

Around 194 crocodiles have been relocated from a lake near the Statue of Unity in Gujarat's Narmada district in the last two years to ensure the safety of tourists, who pay a visit and go for boat rides, news agency PTI has reported. The Panchmuli lake, near the 182-metre tall statue of Sardar Vallabhbhai Patel in Kevadia, called the 'Statue of Unity', had a large number of crocodiles that posed a threat to the visitors, according to officials cited by PTI.

"In 2019-20 (October-March), we relocated 143 crocodiles. In 2020-21, another 51 crocodiles were shifted to two rescue centres in Gandhinagar and Godhra," PTI quoted Kevadia range forest officer Vikramsinh Gabhania as saying on Sunday. "Some 60 cages are placed around the lake to trap the crocodiles. The part of the lake where seaplanes (flying between Ahmedabad and Kevadia) land is completely safe," he told PTI.



Figure 2 News clipping in the newspaper of a press release by the forest department, Gujarat, India.

This mugger relocation operation is one of the most significant translocation operations in the state. It is most probably the first and largest translocation operation recorded in Indian history if it is true. However, there is a different truth behind this translocation of mugger crocodile. Also, this mugger removal operation raises many concerns regarding the faith in the process (Box 1), the legality of the India Wildlife Protection Act 1972 and assurances of wildlife conservation policy, especially the authority who is involved in the entire operation, and the function of forest officials and finally state wildlife policy. However, reality checks and facts show something else about the data, and the facts do not match with the proclaimed news. During visits to both the captive facilities, I experienced the actual physical numbers of rescue muggers and livestock registered data (Central Zoo Authority Inventory of Animals in Indian Zoos) that did not match the press release by the authority.

Box 1: Narmada’s Mugger Translocation & Issues

The translocation of mugger crocodiles, under the pretext of ‘Tourist Safety’, is neither an apt reason nor a good solution because such translocation means shifting the problem from one place to another. This may necessitate many more translocations in the near future, or the species might migrate back to these impoundments. Hence, the so-called problem would persist. The following aspects also need to be considered and/or heeded.

1. In the absence of an unknown number of crocodiles in the present Dyke 3 & 4, it is not possible to claim a crocodile-free water body. Moreover, there is also the possibility of crocodiles entering the dykes from adjoining water bodies that are at a distance of 18 - 20 km from the Narmada Dam and the main river course.
2. Crocodile species have strong homing instincts and tend to return to their original site. This has been scientifically proved in crocodiles Read et al., (2007), including muggers (Vyas and Bhatt, 2004).
3. In 2006, the Forest Department, Gujarat, appointed a crocodilian expert for similar reasons. The expert opinion was that “zero muggers” is not possible for the water body; it is the best site for wildlife tourism, and it is better to develop for that only.
4. The government’s decision to incarcerate and relocate crocodiles from their natural habitat is against the principles of ‘The Wildlife (Protection) Act 1972’. Such an act by the Forest Department, raises questions about its role in the management of wildlife and its habitat.
5. More significantly, the importance of this species is illustrated by the multiple legal and policy efforts that the Government of India has developed to protect the crocodile population.
6. Any activity that is against the survival of the highly protected species without having been approved by the State Wildlife Board and National Wildlife Board and the Government of India is patently illegal. There are established Rules, Regulations, and Policies to be followed before attempting to relocate scheduled species.
7. The translocated muggers kept at the rescue centre, Pavagadh, were not eligible as per CZA guidelines.
8. Also, the authority does not tag (RFID microchips / PIT tags) any muggers as CZA instructions.

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Thus, only 124 muggers' records of translocation were conferred, but 70 muggers recorded untraceable. There were some miscalculations about the rescue muggers at the dam site and their translocation at both the captive facilities. We failed to get facts and operational information and morphometric, gender and capturing techniques of muggers from the forest officials and Sardar Sarovar Dam authorities. However, we gathered some information through print and electronic media, local NGOs and some extracts from legal matters of environmental activists and dugout from forest staff about the details of the operation of mugger rescues and what could be intended for the large numbers of muggers’ translocation programs (Box 2).

Box 2: Story Behind the Mugger Captured and Relocation

The Narmada Dam has long been in the national news, but recent attention has been on a different issue. The Narmada Dam project has been intensely debated due to its massive size of manmade water bodies. Due to the dam construction, large areas of agricultural, scrub and forestlands have been submerged, uprooting thousands of families from their traditional lands and depriving them of their livelihoods and having a negative impact on wildlife (Kaur, 2018). The final status of the environment after the completion of this mega-project is unknown, but clues are emerging to enable us to make predictions about human-crocodile conflict. The muggers occur naturally in many parts of the Narmada River, and they now naturally settled in habitats at the manmade water system of dyke and lake for over a decade.

Local newspapers and media broadcast stories about poor tribal people losing their lives to a population of ‘man-eating’ mugger crocodiles (*Crocodylus palustris*) in the Narmada Reservoir, especially in the vicinity of its Dyke No-3. The mugger crocodile translocation issue was initially started after two fatal crocodile attacks were recorded in Dyke 3, Narmada Dam, on 7 and 15 November 2004; within a week, a son and mother were lost from a poor tribal family. Later, two more crocodile attacks were recorded in the Narmada River. It is estimated over a dozen other attacks may have gone unreported, and local people killed some of the crocodiles involved. Such incidents are, however, restricted to very remote areas inhabited by tribal communities on the borders of Gujarat State and its neighbours. The Narmada Dam has created a platform for various media, tribal welfare groups, activists and politicians to pressure authorities such as the State Forest Department (SFD) to eliminate all muggers from the water body and rehabilitate them away from the human settlements.

On 6th November 2006, we visited Laxman Kund, a backwater pool of the river. The Laxman Kund is the best habitat for over a dozen muggers. The locals believed it was holy animals that muggers never attacked the devotees because it is the vehicle of ‘*Maa Namamidevi Narmada*’. This natural population of muggers is hardly a few kilometers in distance from the dyke lakes. We learnt that the State Forest Department (SFD) had also sporadically rehabilitated mugger crocodiles into the lake system (Figure 4); these were rescued from urban areas (Vyas, 1994). However, an estimation shows two dozen muggers may have been rehabilitated into the dyke lakes over the last few years (Vyas, 1994). Local forest officers estimated there are over 200 muggers in Dyke 3, some of which are 3–4 m long. The SFD 2006 survey estimated over four dozen individuals inhabit the Dyke systems, and there could be no more than 75 individual animals (Vyas and Basu, 2008). However, the issue of removing muggers from the water body was diluted after the SFD's rapid survey and systematic re-assessment of the mugger population, and the water body was proposed for wildlife tourism in the report of.

The recent development of the world's tallest statue at the dame site known as the Statue of Unity (SoU) for the memory of Sardar Patel, known as the Ironman of India, and its surrounding area was developed for tourism, especially developed a facility for seaplane. The dam authority took advantage of the ambitious project of the mega-tourist complex of SoU and again shouted with powers that the mugger should be eliminated from the area for the safety of tourists. Finally, the local bureaucrats achieve dreams of mugger translocation without any protocols.

Many various sizes muggers were captured with the help of bait-trapped cages surrounding the dykes and adjoin river stretches. A total of 194 various sizes of muggers were trapped within 24 months, and some were caged in a temporary enclosed constructed (Figure 5) at Bhumaliya-Gadkoi village (21°53'18.85"N; 73°43'41.93"E). Some were released in the backwaters of the dam side and upper Narmada River, and 51 muggers were translocated at two captive facilities (Indroda Nature Park, Gandhinagar and Pawagadh Rescues Center (Figure 6), Panchmahal [22°29'10.95"N; 73°31'25.69"E]), as per an office press note. Unfortunately, officers did not disclose the numbers of actual trapped, released and translocated animals, but a large number of muggers died during the capturing operation and in temporary enclosures at Bhumaliya-Gadkoi. However, the mugger capture and translocation-related activities are mentioned in (Table 1).

Table 1
The chronological details of actions -related to mugger capture and translocation activities, Narmada Dam, Kevadia, Narmada, Gujarat.

Date	Action / Steps Taken /News	Comments
December 2018	The Dam Authority Sardar Sarovar Narmada Nigam Ltd (SSNNL) and Forest Department estimated 500 mugger crocodiles inhabit the area.	The numbers are exaggerated speculations without any scientific evidence/survey.
1 January 2019	The authorities started the mugger crocodile capturing program with the help of local trappers and volunteers from NGOs	The entire operation is carried out without the supervision of experts.
22-26 January 2019	Blast in waters - Numbers of fish and muggers died in Dyke 3	Culprits took action, but authorities did not take action or legal stapes, nor any enquiries about the blast
1 February 2019	60 croc-trapped cages deployed surrounding the water body of all three Dyke – for catching muggers	Captured animals sifted in temporary enclosures
10 September 2019	A sea-plane facility was developed in Dyke 3 for international and national tourism.	To promote tourism at the Statue of Unity (SoU)
Between October 2019 to March 2020	143 various sizes of muggers trapped from all three Dyke. 73 animals were released on the upper Narmada Dam site, remains captured 70 animals were sifted in temporary enclosures	There was hardly 15-20 km distance between the capture to release site.
Between April 2020 to March 2021	51 various sizes muggers were shifted to rescue center – Gandhinagar and Godhara	25 animals at Indrod Nature Park, Gandhinagar. 26 animals at Pavagadh Rescue Center, Panchmahal District.
16 November 2021	News came out about the notable number of muggers found dead at Bhumaliya-Gadkoi, Kevadia Rescue Center.	Due to inadequate facility
1 May 2022	House Boat – a floating hotel launched in Dyke 3	Promote tourism at the dam site
February 2024	The seaplane not yet flown/ operated	Finally, it is considered as not a viable project

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Figure 3 The mugger crocodile has cultural significance: The ‘Maa Namamidevi Narmada’ (River Goddess) with her vehicle. (Photo Credit: Raju Vyas).



Figure 4 Image of rescued a large mugger from urban habitat and released at Dyke 3, Narmada Dam, Gujarat. (Photo Credit: Raju Vyas)



Figure 5 The mugger capturing operation at temporary enclosers, Bhumaliya-Gadkoi village, Kevadia, Gujarat. (Photo Credit: Raj Bhavsar)



Figure 6 Image of mugger enclosure at Animal Rescue Center, Pavagadh, Panchmahal, Gujarat. (Photo Credit: Raju Vyas).

3. DISCUSSION

Finally, it concluded and detected that the mugger translocation was not well-organized Ghai, (2019), and authorities were not ready to share any information about the number of translocated muggers and their protocols. The entire translocation program needs to be respected by the forest department's order (no. 5903-72/2017-18, Date 28/09/2017) and Standard Operating Procedure (SOP), and it

disregards the manual. We cannot find actual facts and details of the mugger translocation from the authorities. It was a big question—why do authorities hide the exact facts of translocations and their intention?

The guidelines for reintroductions and other conservation translocations stated that translocations should be fully documented and their outcomes made publicly and suitably available to inform future conservation planning (IUCN, 2013). However, the present case indicates that the authorities should have shared the details of the translocation information, and they also did not respect and accept the IUCN translocation guideline, which is widely internationally accepted. Thus, we fail to value the entire mission, especially learning from past translocation successes and failures, which may be a vital step, beginning at the planning stages of a translocation project (Berger-Tal et al., 2020). Finally, stated that the mugger translocation is the bloomer from SoU, Kevadia, Narmada District, Gujarat, India.

4. CONCLUSION

However, this is the first and largest translocation operation of Marsh Crocodiles captured from the wild in Indian history. Recent news shows the largest number of muggers translocation in Gujarat, as 850 surplus Muggers were shifted from Madras Crocodile Bank Trust (MCBT) to the Green Zoological Rescue and Rehabilitation Kingdom, Jamnagar, Gujarat. This was the most significant transfer in crocodilian history between the captive facilities, without any injuries or mortality of Muggers (Nikhil Whitaker, MCBT, Personal Communication). Thus, these two translocation programs are indirectly indicated; it is the first sign that marsh crocodile numbers are gradually rising in good numbers, either in the wild or in captivity.

Therefore, some management strategies and action plans are needed to mitigate demographic issues with such large carnivore animals as marsh crocodiles. If we do not tackle the problem in a timely manner within a time-bound period, it might result in aggregated human-crocodile conflicts, especially in mugger-infested areas. Finally, the mugger exclusion from the area is not only a conservation concern but also a matter of Hindu religious condemnation. Since the river pilgrims believe the mugger is a vehicle of '*Maa Namamidevi Narmada*' (Figure 3). If the authority eliminates the mugger from the 'River Narmada', it will hurt the faiths of millions of devotees and damage the beliefs of 'River Parikrama' (circumambulation) and the philosophy of 'Moksha' (salvation). The mugger crocodile flourishes in the river, which is a conservation matter and has the same cultural significance.

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Conflicts of interests:

The authors declare that there are no conflicts of interests.

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Ethical approval

The Animal ethical guidelines are followed in the study for species observation & identification.

Data and materials availability

All data associated with this study are present in the paper.

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